

What is Claimed is:

1. A glass fiber exhibiting good moisture resistance wherein said fiber is prepared from a glass composition consisting essentially of:

38-52 wt% SiO₂,

8-17 wt% Al₂O₃,

7-17 wt% B₂O₃,

0-7 wt% R₀, wherein R is Ca, Mg, or a combination thereof,

20-31 wt% R¹₂O, wherein R¹ is Na, K, or a combination thereof, and

0-2.5 wt% Li₂O

and has a Final Aged Tensile value of at least 3000;

a HTV of 1700° F or less and a liquidus temperature at least 100° F lower than the HTV.

2. The glass fiber of claim 1, wherein the Final Aged Tensile value is at least 4000.

3. The glass fiber of claim 2, wherein the glass composition has a liquidus temperature at least 300° F lower than the fiberization temperature.

4. The glass fiber of claim 2, wherein the glass composition has a liquidus temperature at least 400° F lower than the fiberization temperature.

5. The glass fiber of claim 2, wherein the glass composition has a liquidus temperature at least 450° F lower than the fiberization temperature.

6. The glass fiber of claim 1, wherein said glass composition is processed at a fiberization temperature of from 1450 to 1700° F without crystallization during processing.

7. The glass fiber of claim 1, wherein said glass composition is processed at a fiberization temperature of from 1500 to 1650° F without crystallization during processing.

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8. The glass fiber of claim 1, wherein said glass composition is processed at a fiberization temperature of from 1450 to 1700° F without crystallization during processing and has a liquidus temperature at least 100° F lower than the fiberization temperature.

9. The glass fiber of claim 1, wherein said glass composition is processed at a fiberization temperature of from 1450 to 1700° F without crystallization during processing and has a liquidus temperature at least 300° F lower than the fiberization temperature.

10. The glass fiber of claim 1, wherein said glass composition is processed at a fiberization temperature of from 1450 to 1700° F without crystallization during processing and has a liquidus temperature at least 400° F lower than the fiberization temperature.

11. The glass fiber of claim 1, wherein said glass composition has a SiO₂ content of 45 wt% or greater.

12. The glass fiber of claim 1, wherein said glass composition has a Al₂O₃ content of 12 wt% or greater.

13. The glass fiber of claim 1, wherein said glass composition has a B₂O₃ content of 12 wt% or greater.

14. The glass fiber of claim 1, wherein said glass composition has a combined Al₂O₃ and B₂O₃ content of 24 wt% or greater.

15. The glass fiber of claim 1, wherein said glass composition has a combined Al₂O₃ and B₂O₃ content of 20 wt% or greater and a SiO₂ content of 45 wt% or less.

16. The glass fibers of claim 1, wherein said fibers have a measured biodissolution rate of greater than 300 ng/cm²/hr.

17. The glass fibers of claim 2, wherein said fibers have a measured biodissolution rate of greater than 300 ng/cm²/hr.

18. The glass fibers of claim 3, wherein said fibers have a measured biodissolution rate of greater than 300 ng/cm²/hr.

19. The glass fibers of claim 1, wherein said fibers have a measured biodissolution rate of greater than 400 ng/cm²/hr.

20. The glass fibers of claim 2, wherein said fibers have a measured biodissolution rate of greater than 400 ng/cm²/hr.

21. The glass fibers of claim 3, wherein said fibers have a measured biodissolution rate of greater than 400 ng/cm²/hr.

22. A glass fiber exhibiting chemical resistance, moisture resistance, and biosolubility, wherein said fiber is prepared from a glass composition consisting essentially of:

40-52 wt% SiO₂,

8-15 wt% Al₂O₃,

8-15 wt% B₂O₃,

0-7 wt% R₀, wherein R is Ca, Mg, or a combination thereof,

20-28 wt% R¹₂O, wherein R¹ is Na, K, or a combination thereof, and

0-2.0 wt% Li₂O

and has a Final Aged Tensile value of at least 3000;

a HTV of 1700° F or less and a liquidus temperature at least 100° F lower than HTV.

23. A glass fiber exhibiting chemical resistance, moisture resistance, and biosolubility, wherein said fiber is prepared from a glass composition consisting essentially of:

41-49 wt% SiO₂,

8-12 wt% Al₂O₃,

10-15 wt% B₂O₃,

0-5 wt% R₀, wherein R is Ca, Mg, or a combination thereof,

20-25 wt% R¹₂O, wherein R¹ is Na, K, or a combination thereof, and

0-1,0 wt% Li₂O

and has a Final Aged Tensile value of at least 3000;

a HTV of 1700° F or less and a liquidus temperature at least 100° F lower than HTV.

24. A method for preparing glass fibers, which comprises contacting a primary with sufficient high temperature to create a loss of more volatile compounds of the glass composition from the outside of the primary to thereby create an outside shell which has a different composition than the fiber interior, wherein the primaries are prepared from a composition comprised of:

40-52 wt% SiO₂,

7-17 wt% Al₂O₃,

7-17 wt% B₂O₃,

0-7 wt% R₀, wherein R is Ca, Mg, or a combination thereof,

20-31 wt% R¹₂O, wherein R¹ is Na, K, or a combination thereof, and

0-2.5 wt% Li₂O

wherein the glass fibers exhibit biodissolution in excess of 150 ng/cm²/hr, and has a Final Aged Tensile value of at least 3000; a HTV of 1700° F or less and a liquidus temperature at least 100° F lower than the HTV.

25. The method of claim 24, wherein the composition is processed at a fiberization temperature of from 1450 to 1700° F without crystallization during processing.

26. The method of claim 24, wherein a pot and marble technique is employed to prepare the glass fibers.

27. The method of claim 24, wherein a direct melt method is employed to prepare the glass fibers.